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TITLE: Specific magnetosome, method for the production and use thereof

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## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bauerlein; Edmund	Munchen			DE
Schuler; Dirk	Stassfurt			DE
Reszka; Regina	Schwanebeck			DE
Pauser; Sabine	Berlin			DE

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## CLAIMS:

What is claimed is:

1. A magnetosome having a surface, and comprising a magnetite monocrystal having a maximum diameter of 45 nm surrounded by a phospholipid membrane.
2. A magnetosome of claim 1, wherein said membrane comprises at least one of phosphatidyl ethanolamine, phosphatidyl glycerol, and phosphatidyl choline and containing at least one of palmitic acid, paltitoleinic acid and oleic acid.
3. The magnetosome of claim 1, wherein said membrane comprises 53%.+-.6% phosphatidyl ethanolamine, 38%.+-.6% phosphatidyl glycerol, and 8.9%.+-.5% phosphatidyl choline.
4. The magnetosome of claim 1, in the form of chains of maximum 100 magnetosomes, and having a cationic surface charge.
5. The magnetosome of claim 4, wherein said chains comprise from 10 to 60 magnetosomes.
6. The magnetosome of claim 1, further comprising one or more antibodies.
7. The magnetosome of claim 6, wherein at least one or more of said antibodies is bound to said membrane.
8. The magnetosome of claim 1, wherein the magnetosome is packed within a liposome.
9. The magnetosome of claim 8, wherein said liposome is one of a stealth liposome, a micellar system, an immunoliposome, a cationic liposome, or a fusogenic liposome.
10. The magnetosome of claim 1, further comprising at least one antibody chemically coupled to said surface.

11. The magnetosome of claim 1, further comprising a radionuclide therein.
12. The magnetosome of claim 1, further comprising one or more gene diagnostic agents and a cationic complex for the transfer of genes.
13. A method for preparing the magnetosome of claim 1, which comprises isolating the magnetosome from the magnetic bacterium *Magnetospirillum gryphiswaldense* by fermentation in a culture medium which does not contain complexing agents for iron, the oxygen concentration in the medium being maintained below 2%, adding Na acetate and  $\text{FeSO}_4$ , gathering the magnetic cells, and after lysis of cells recovering the magnetosome by magnetic separation of the cell fragments and cell sap.
14. The method of claim 13, wherein said magnetic cells are gathered by centrifuging, and said magnetic separation is carried out in a magnetic separation column.
15. The method of claim 14, wherein said magnetic separating column employs a samarium/neodymium permanent magnet.